

7.3 Compound Interest: Present Value

Present Value: The principal that must be invested today to obtain a given amount in the future

So lets solve for P....

$$A = P(1+i)^n$$

to find P divide both sides by $(1+i)^n$

$$\Rightarrow \frac{A}{(1+i)^n} = \frac{P(1+i)^n}{(1+i)^n} \quad \text{simplify}$$

SO:

$$\Rightarrow P = \frac{A}{(1+i)^n} \quad \text{OR}$$

$$P = A(1+i)^{-n}$$

Ex 1:

Jessica wants to have ^A\$15000 in 7 years. Her bank will pay her 5%/a interest compounded quarterly. How much does she have to invest now to have the money in the future?

$$P = \frac{A}{(1+i)^n} \\ = \frac{15000}{(1+\frac{0.05}{4})^{28}}$$

$$P = 10593.28$$

so she should invest
\$10593.28 now.

Ex 2:

Phil wants to buy a car worth \$20 000 5 years from now.

- a) How much should he invest in a GIC account earning 6%/a compounded semi-annually?
b) How much interest did he earn?

$$P = \frac{20000}{(1+\frac{0.06}{2})^{10}}$$

$$a) 14981.88$$

$$b) 5118.12$$

Ex 3:

Megan will receive \$5000 on her 21st birthday from her parents who invested when she was born. If the interest rate was $4\frac{3}{4}\%$ compounded monthly, how much did her parents invest when she was born?

$$\frac{4.75\%}{12}$$

∴ they invested

\$1847.64 when
she was born

$$P = \frac{5000}{\left(1 + \frac{0.0475}{12}\right)^{252}} = 1847.64$$

Ex 4: Read example 3 page 474

